County Psychopathic Hospital are denied to those seeking it of their own volition. This provision will make available the resources of such psychopathic hospitals for diagnosis and helpful service to many patients whose needs are as urgent and whose claim upon society is as great as is the case of the unfortunate who suffer from other conditions of ill health and who now enter freely into the general hospitals for relief. Most of such voluntary patients are not committable under the present law.

HOSPITAL SUPERINTENDENTS SHOULD BE LICENSED PHYSICIANS

To Section 2152 an amendment is being asked striking out that portion of the section providing that the medical superintendent of the Patton State Hospital must always be a homeopathic physician but who must in other respects possess the same qualifications as other medical superintendents. Such amendment would leave the matter of the selection of the superintendent of Patton State Hospital entirely optional with the board or department of institutions and would make available for that position a qualified physician from any school with the same qualifications as apply to all other state hospitals. We believe that conditions prerequisite to the appointment should be determined entirely by the physician's qualifications rather than by the school from which he graduated. As a matter of fact, two of the present superintendents of California state hospitals are graduates of homeopathic schools and ably discharge their duties.

USE OF WORD "APPREHENDED" INSTEAD OF "ARRESTED" REMOVES STIGMA OF "ARREST"

A new provision is being proposed that in all sections relating to the apprehension and commitment of persons alleged to be insane there be substituted the word "apprehended" wherever the word "arrested" appears. The merit of this proposal is so self-evident that it needs no comment. It is only one step further in removing the stigma in situations where the state has to deal with its mentally sick.

COMMENT

Believing as we do that these measures are primarily in the interests of a kindlier and more efficient administration of scientific service to the mentally sick by those of the profession whose activities are in this particular field, we feel that the profession at large will want to assist in our endeavor. The support of the California Medical Association and its official journal, in enlisting the sympathetic and active support of the medical men throughout the state is greatly appreciated. There ought to be no opposition to these amendments. They can in no sense be considered controversial, and if they are defeated it will simply be through lack of support and effort on the part of those citizens whose knowledge of these problems should place upon them special responsibilities in bringing about a better state of affairs.

910 Pacific Mutual Building.

RADIATION THERAPY OF CARCINOMA OF THE RESPIRATORY TRACT*

REPORT OF CASES

By ORVILLE N. MELAND, M. D.
Los Angeles

DISCUSSION *by H. J. Ullmann, M. D., Santa Barbara; Fredrick H. Rodenbaugh, M. D., San Francisco; Alfred C. Siefert, M. D., Oakland.*

ANY therapeutic attack on malignancy of the respiratory tract is surrounded by many difficulties, of which the first is accuracy in diagnosis, since the parts involved are frequently inaccessible to sight and touch. The diagnosis must then be based on a careful clinical history and x-ray studies, as biopsy cannot always be carried out. Furthermore, most patients coming for aid have used home remedies for a long time or they have been treated as tuberculosis suspects before the true nature of their disease has been seriously considered. During the last decade, however, the more frequent use of the direct laryngoscope and the bronchoscope has simplified the problem, since they alone give a true visualization of the pathologic condition and enable one to obtain tissue specimens to verify clinical findings.

For purposes of brevity and discussion we will not take up mediastinal growths in this paper. We will discuss the problems involved in treating lesions in the larynx, trachea and bronchi, and metastatic lesions in the lung itself.

CARCINOMA OF THE LARYNX

Most of the older literature on carcinoma of the larynx deals with its surgical relief. In recent years, however, irradiation has had many advocates. The consensus of opinion at present among laryngologists is that the early intrinsic variety should be treated surgically by means of laryngofissure or by total laryngectomy. Indeed, the work of St. Clair Thomson of London and James McKenty of New York shows that a high degree of curability is attained by these methods. Extrinsic carcinoma and intrinsic carcinoma, associated with metastasis to the regional lymph nodes, have been relegated to the radiologist, but invariably the results have been palliative rather than curative. The literature makes mention of some five-year cures of laryngeal carcinoma from x-ray and radium therapy alone. Soiland has had under his observation two patients that have passed the ten-year period; these were treated with the old irritating steel radium needles, placed within the larynx, and are ample evidence of the value of irradiation in selected individuals. Of course, the majority of the patients we have seen have been terminal cases, but even in the early intrinsic cases where operation is refused the results have been largely palliative. In the advanced cases no great improvement could be expected.

* From the Soiland Clinic, Los Angeles.

* Read before the Radiology Section of the California Medical Association at the fifty-ninth annual session at Del Monte, April 28 to May 1, 1930.

What were the causes of failure in some of the early cases? Close analysis reveals that the following points must be considered:

1. *The Resistant Type of Cell That is the Basis of the Growth in This Locality.*—These tumors are squamous-cell carcinomas and experience has shown that they are extremely resistant to irradiation, but, on the other hand, they do at times succumb to large doses. However, the effects of such doses on the normal structures are not always favorable. Cartilage is quite susceptible to irradiation injury, especially where there is an associated infection. When this is the case, a chronic chondritis with edema, and pain and sloughing of the tissues ensues, which is disconcerting to patient and physician alike.

2. *Imperfect Distribution and Calculation of Dosage.*—Too often we try to rely on one type of irradiation which, if pushed to the limit of skin tolerance, gives a dosage which falls short of eradicating the pathology. The classic work done at the Memorial Hospital in New York by Hayes and Quimby shows that for squamous-cell carcinomas the necessary dosage is not one erythema dose, but several erythema doses, varying from five to eleven. This requires the use of different types of irradiation distributed through multiple ports. A combined external irradiation obtained by both high voltage x-ray and radium packs over the same portals, supplemented by interstitial radiation from platinum filtered needles of low intensity or gold radon implants, is necessary to satisfy these essentials. By these methods a proper dosage is obtainable which will eradicate hitherto resistant tumors.

3. *Relying on Irradiation Alone.*—As radiologists, we do not call in our confrères often enough to help solve our problems. When an associated infection with edema is already present, irradiation is practically certain to fail. A tracheotomy will be of immense aid, for it will put the parts at physiologic rest and will insure adequate drainage. The patient can then breathe with no fear of impending suffocation while under intense therapy.

COMMENT

These are, then, the points we must consider. If we bear them in mind we will improve our results, especially if we are fortunate enough to work in conjunction with a good laryngologist and bronchoscopist.

In the early intrinsic type of case where laryngectomy is refused, a new technique has been recently evolved. Harmer of London has described an operation that he combines with radium irradiation, which has been very successful over a three-year period. He removes a window of cartilage from the lateral walls of the larynx, using great care to avoid perforating the mucous membrane. Into the defect thus made he places platinum filtered one-milligram needles of radium which remain *in situ* from five to seven days, and which irradiate the growing base of the tumor and result in a prompt response and gradual disappearance of the malignant cells. The advantages of this method are: (*a*) It does away with troublesome chondritis seen after interstitial radiation within the larynx or heavy external irradiation. (*b*) It does not mutilate the patient, but gives him a good speaking voice. (*c*) Where it is not wholly successful it does not prevent laryngectomy nor does it make this more difficult later on.

The procedure will not be universally adopted, since very few workers have radium available in needles of the proper length, dosage and filtration, but the patient should be informed of the method so that if he is financially able to take advantage of it he can.

CARCINOMA OF THE TRACHEA AND BRONCHUS

Carcinoma involving these structures is not a surgical condition. Its recognition lies with the bronchoscopist and to him we owe the early diagnosis through direct exposure and biopsy. Except for some palliation by the use of opiates, the therapy must rest largely with the radiologist. Surface irradiation by high voltage x-ray and radium packs will undoubtedly have a retarding effect on the rapidly multiplying cells, but adequate dosage cannot be obtained in this manner alone. We must, then, fall back on direct implantation of needles containing the salts of radium or the gold seeds of radon through the bronchoscope. Of the two methods of implantation, the needles, although giving a better and more uniform irradiation, are the least desirable because of the anchoring threads which extend into the mouth and which lead to an irritating cough. Gold implants, on the other hand, are more easily placed and are not followed by any complications. It may be necessary to repeat this procedure after three or four months, but it secures for the patient comfort as no other recognized method can.

REPORT OF CASES

Below are the histories of two patients in whom excellent palliative results have been obtained. The patient with carcinoma of the bronchus has done remarkably well.

CASE 1. *Adenocarcinoma of Trachea.*—Mrs. W. Age, fifty-five. First seen February 9, 1929. For two years she had had shortness of breath and has been treated by ten physicians for "heart disease." She had a rasping respiration and such a marked dyspnea on slight exertion that she was hardly able to walk across the room. She then consulted her family physician, who suspected some tracheal disturbance and referred her to Dr. Simon Jesberg for bronchoscopy. A malignant polyp with napkin-ring infiltration was discovered above the bifurcation. The polyp was removed and the patient was referred to us for irradiation. A course of high voltage x-ray was given over the involved area and she was comfortable for eight months, when dyspnea and substernal pain recurred. Another bronchoscopic examination showed a moderate stenosis, but the walls of the trachea were smoothly healed and there was no bleeding on manipulation. Some of the tissue was curetted out by Doctor Jesberg, after which another course of x-radiation was given. Relief of precordial oppression followed, with a gain in weight of twelve and one-half pounds. At present the patient is very comfortable.

CASE 2. *Adenocarcinoma of Right Bronchus.*—Mr. B. Age, sixty-one. First seen December 7, 1927. In March of 1927 patient had a pneumonia which was complicated by a pulmonary abscess in the right lower lobe. Bronchoscopic examination by Doctor Jesberg at this time failed to reveal anything but an inflammatory condition. As the patient was getting no better, he went to the Mayo Clinic where another bronchoscopic examination showed that a carcinoma was obstructing the right lower bronchus, and he was directed to have some x-radiation. He returned to his home in Nebraska, where Doctor Tyler of Omaha gave him a course of high voltage x-radiation; and on his return to California in December we gave him another course. He gained a little, but was not very strong. Following this, radium needles of ten milligrams each were plunged into the growth by Doctor Tyler on two occasions and by us on one occasion, at intervals of two months. He has regained his old strength and he now weighs one hundred and seventy-six pounds, which represents a gain of forty pounds. The last bronchoscopic examination revealed only a little granulation tissue at the point of the original growth. Except for a slight cough with mucoid expectoration, he considers himself in good health. In this patient the combined use of surface and interstitial irradiation has been of great value, as it is now almost three years since the original growth was discovered.

CARCINOMA OF THE LUNG

Primary malignancy of the lung is of two types: one grows from the alveolar epithelium, the other from the epithelium lining the bronchi, and hence called bronchogenetic. The location of these two kinds of tumors is found in different portions of the lung, since the alveolar is peripheral while the bronchogenetic is found at the hilus. The latter is sometimes confused with the mediastinal tumors encroaching upon the hilus. From a histologic viewpoint some of these are endothelial in origin. The response to treatment of these primary tumors is radically different; the alveolar carcinoma is remarkably resistant and the prognosis is correspondingly poor. On the other hand, tumors in the hilus area are quite sensitive, especially the endotheliomas. What appears at first a hopeless condition often disappears after a thorough course of irradiation, so that all should be given the benefit of the therapeutic test. Inasmuch as these patients are septic and have an associated lung suppuration from occlusion of or pressure on the bronchus, bronchial drainage by bronchoscopic suction carried on in conjunction with irradiation may increase the favorable responses. In reviewing our records we have several patients with hilus tumors who have successfully passed the five-year period. Their bloody, purulent expectoration has disappeared; they have gained weight, and have again become useful members of society. However, in all of them the diagnosis is clinical and based on radiological evidence and not on a histologic basis. A typical history is given below.

W. E. Male. Age, forty-seven. Seen May 1926. Referred by Dr. C. C. Browning. For four months had a severe sore throat, but two months ago he noted pain in chest. During that time he had no temperature, but he had a cough which was aggravated when recumbent. He had had a rapid pulse. Four weeks ago he began to expectorate a great deal, but when the sputum was examined no tubercle bacilli were found. His normal weight was 165 pounds a month ago; now 125 pounds.

Examination.— Physical examination was negative except for dullness and absent heart sounds in left base.

X-ray film shows tumor mass in left lower lobe.

Patient was given a thorough course of high voltage x-ray and gained twenty pounds in six weeks. Cough disappeared and his strength returned. At present he is living and well, with no evidence of disease—four years after radiation therapy was instituted.

METASTATIC MALIGNANCY OF THE LUNG

Every one of us has seen patients with deposits in the lung secondary to carcinoma or sarcoma elsewhere. In patients of this group, irradiation has been of little avail. Failure is attributed to the cachexia which is present and to the extensive involvement in other organs which lowers the individual's resistance. Unquestionably, some of the nodules are sensitive to irradiation, but the technique as used at present may not be proper. Kolodny reports a case of bone sarcoma in whom metastatic areas in the lung have disappeared completely after irradiation and this patient has remained well for over two years with no recurrence. Likewise, Burnham, in a personal communication, says that he has had a patient under observation for many years who had an apparently hopeless metastatic involvement of both lungs and in whom the malignancy disappeared completely after applying fifty milligrams of radium at a time for twenty-four hours through multiple ports on the chest over a period of thirty days. Under this slow irradiation technique there was no general reaction, but a gradual improvement on the part of the patient. Present-day methods of intense x-radiation overwhelms the patient and he frequently loses ground. Ullmann, who has done much work in the field of lead therapy, combines chemotherapy with irradiation and has been able to show remarkable retrogression in the type of individual under discussion. Possibly further work along these lines with other less toxic products combined with a slow mild gamma or x-radiation may give the desired effects.

SUMMARY

In conclusion, we feel that in carcinoma of the respiratory tract, accuracy in diagnosis is the first essential for improving irradiation results. A biopsy in laryngeal and bronchial carcinoma is necessary to determine the type and to compute the amount of radiation that experience has shown is necessary for eradication. More frequent resort to a tracheotomy will give greater palliation in the advanced cases, and it will also enable the radiologist to give adequate dosages which otherwise must be omitted in the absence of drainage.

1407 South Hope Street.

DISCUSSION

H. J. ULLMANN, M. D. (1520 Chapala Street, Santa Barbara).—I was much interested in the part of Doctor Meland's paper referring to malignancy of the lung itself. I believe that everyone with malignancy of the lung should be given the benefit of thorough radiation, not in one large dose, but spread over a considerable period of time so as to produce no roentgen sickness or other deleterious effect from the therapeutic agent. While the percentage of cures will

be very small, some patients will be definitely helped. Doctor Kirkland spoke along this same line when he visited the meeting of this association a year ago. Between two and three years ago a patient was referred to me for malignancy of the lungs proper, with a request from his referring physician that as the patient was feeling quite well, he not be made sick by any procedure. At this time the symptoms were entirely those of cough and mild dyspnea. He was given thorough radiation spread over a considerable period of time, and after a rest of a month to six weeks the entire course was repeated. His cough and dyspnea disappeared, and he is apparently free of his disease after a period of practically two years. I trust Doctor Meland's paper will be widely read, for it is essential that physicians who see these unfortunate patients should know that under proper treatment a small percentage may be cured, and a still larger percentage benefited.

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FREDRICK H. RODENBAUGH, M. D. (490 Post Street, San Francisco). — Any improvement in technique which will be helpful in the types of cases described by Doctor Meland is of interest because of the small number of cures in this group as a whole, and the relatively radio-resistant type of cell so frequently encountered. The results in general have developed an extreme degree of pessimism in the general profession.

There is in the laryngeal group some promise in the newer technique of using large packs of radium with high filtration, and there has been a distinct improvement in results from this comparatively new procedure. Analogous tumors of the upper respiratory tract have shown regression with use of such technique, that previously had failed to respond favorably.

Improved results will probably be noted in lesions of the upper respiratory tract, but the response of similar lesions of the lungs with the same methods, in our experience, has been most discouraging.

The lymphoid tumors and sarcomas, excluding the extensive metastases, show the greatest regression and patients remain free from symptoms for a relatively long period of time; but with the carcinoma we have only noted mild regressions of rather short duration from external radiation.

I personally feel that marked progress is doubtful from external radiation, but with the development of bronchoscopic technique and the use of massive doses of radium, there has been some promise in selected cases within the range of instrumentation.

I endorse Doctor Ullman's views that the profession at large should know that with proper radiation a definite number of patients can be relieved of symptoms for long periods of time, and a marked palliation given to a still larger number of otherwise hopeless patients.

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ALFRED C. SIEFERT, M. D. (Merritt Hospital, Oakland).—Doctor Meland's essay has been of particular interest to me because of its note of encouragement and optimism in the treatment of carcinoma of the respiratory organs.

For my brief discussion I am going to pick out the primary bronchopulmonary carcinomata and the malignant metastatic neoplasm of the lung. The primary carcinomata have been to me a source of great dissatisfaction both as to diagnosis and treatment. It is not an uncommon condition. During the current year I have seen and have been consulted on five such cases. That is a good many to see in a purely private practice. Sometimes the diagnosis is ridiculously easy, at other times the condition is confused with pulmonary tuberculosis, abscess, and empyema. I made all these mistakes on a single case in succession, which finally at autopsy—after thoracotomy with evacuation of great quantities of stinking pus—proved to be a bronchial carcinoma.

Three patients I have recently treated by means of short wavelength roentgen radiation without even palliative success. Two are dead—bronchial carcinoma—another will be soon. Degeneration centrally of the tumor with formation of a fatty substance similar to that found in a dermoid or sebaceous cyst should not be booked on the credit side of radiation therapy or chemotherapy; it takes place in untreated tumors as well, and the tumor grows merrily on at the periphery. Infection or hemorrhage by erosion of a large vessel is frequently the direct cause of death in a disease which, according to my experience, lasts on the average one year from its probable inception.

Hemorrhage was the cause of death in a patient about whom I was recently consulted and whom I advised should be taken to the Memorial Hospital, New York, to be treated with radium radiation in large amounts percutaneously. Homogeneous percutaneous gamma radiation with large amounts of radium is my hope for the future.

Metastatic malignancy of the lung I have hardly attempted to treat in earnest hitherto. These patients are usually so miserable from the extreme dyspnea that at most I have given a few consolation doses, and allowed them to die in peace. Euthanasia has usually been accomplished with liberal use of narcotics and death has followed in a few days after diagnosis of the condition.

Now, I am not a pessimist in the treatment with radiation of all carcinoma and even less in cases of thoracic neoplasm in general. I believe these patients should always receive diagnostic radiation therapy, but I cannot help, because of my own many sad experiences, but be discouraged in treatment of carcinoma of the bronchi and lungs.

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DOCTOR MELAND (Closing). — The purpose of the paper is to direct attention to what irradiation does occasionally accomplish in malignancy of the respiratory tract. Failures are common, but the brilliant results which are seen at times justify the use of irradiation. What the future has in store is problematic; whether the use of massive amounts of highly filtered radium externally, or the implantation of radon seeds, will give more hope, can only be determined after a few years. However, I feel as Doctor Ullmann, that thorough irradiation spread out over a period of time will give a few cures and a great deal of palliation.

ABDOMINAL ALLERGY IN INFANCY*

By HENRY E. STAFFORD, M. D.
RICHARD G. WATSON, M. D.
AND
LAWRENCE R. JACOBUS, M. D.
Oakland

DISCUSSION *by William Palmer Lucas, M. D., San Francisco; Albert H. Rowe, M. D., Oakland; Ralph Bowen, M. D., Memphis, Tennessee; Edward S. Babcock, M. D., Sacramento.*

COLIC, as a diagnosis, is unsatisfactory and inadequate. However, it describes a group of symptoms to which no other term seems quite applicable, *i. e.,* that of a baby flushed from crying, irritable, hypersensitive, at times eructing or expelling flatus, sometimes vomiting. Such a picture is as common as the underlying cause, and appropriate treatment is varied.

RECOGNIZED CAUSES OF COLIC

Supplementary feedings or an adequate formula will suffice in relieving the majority of colicky infants. The removal of fat or carbohydrate to a quantity which is not in excess of

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